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ABSTRACT

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# Market Structure and Institutional Position Analysis of Regional Market Segments in Private College Recruiting

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ABSTRACT

Marketing and market research concepts and techniques have formally entered the world of college recruiting in recent years, and it is anticipated that institutional researchers will be called upon increasingly in the near future to perform such research. This paper presents several of the techniques which have been used as part of a comprehensive market research program at Carleton College.

The basic focus is on regional segments in Carleton's applicant pool. Carleton's position in the market is examined in relation to selected types of schools with which it competes for applications from prospective students and for enrolling students. Application overlap, yield (matriculation) from applicants, applicants' perceptions of Carleton and the competition, and the association between comparative perceptions and yield are all investigated. Analytic techniques include interregional comparisons of frequency distributions, cross tabulations, multidimensional scaling, and regression analysis.

Within the limits of confidentiality of information, the marketing implications of the research are briefly explored.

Market segments and institutional positioning have become buzz-words among college admissions personnel. They represent concepts which have made major contributions to the field of market research, and are beginning to make a formal contribution to higher education marketing (where they have been part of the intuitive and unformalized modus operandi of good admissions officers and high level administrators for years).[2] Although these terms have become verbal trademarks of a new breed of professional and a new era in admissions work, they have not been presented effectively or discussed in the literature of the institutional researcher. As admissions officers face the demographic and cultural forces which impell us toward a need for more effective marketing of higher education, it follows that institutional researchers will be called upon increasingly to provide the kinds of information and analysis which market researchers have been providing marketers in other fields of endeavor. In fact, there are good arguments for executing higher education market research and marketing within the higher education system (Litten, 1978).

This paper presents one component in a comprehensive market research program which has been carried out at Carleton College in an effort to better understand our market and more effectively plan and execute our recruitment efforts and our institutional development. It is essentially a sampler of some of the types of analysis and methods of data presentation which we have used. We will report on our use of market segmentation and institutional position analysis in hopes of stepping into the breach between hip phrases and the pedestrian practice of institutional research. At the same time, we seek in this paper to cover some new ground. Several of these techniques of analysis or data display have not been presented previously in the higher education marketing literature; they are particularly adapted to the small college which operates with small computers. With this paper we

wish to present some of the methods of collegiate market research and some of the insight it can introduce to the planning of recruiting activities and the development of institutional responsiveness to conditions in the market.

At this point we should develop a working definition of our basic concepts: market segments, segmentation, position, and positioning.[3] A market segment is a group of consumers or clients in the market with common characteristics which differ from other groups. These defining characteristics may be demographic (age, education, marital status, etc.), psychological (personality, etc.), or product or service oriented (use levels or purposes of use, perceptions or preferences for characteristics associated with the product or service) (Cf., Frank, Massy & Wind, 1972; Dhalla & Mahatoo, 1976). Market segmentation is the operational definition of these groups, preferably on an empirical basis, for purposes of research or marketing targeted to the specific group or groups. Such segmentation recognizes the fact that consumers are not identical; they have different concerns, interests, and preferences which must be met in marketing a product or a service.

A market position for a product or service -- in our case a college -- has been variously defined. Some authors use the term to mean <u>recognition</u> of the college by individuals in the market place, generally because it has distinctive attributes (Geltzer and Reis, 1976). A more common usage refers to differentiation of a college <u>in relation to</u> other colleges and in relation to demand for various types of colleges or programs (Kotler, 1975, Ch. 6). Market research generally portrays a market graphically as a space defined by axes. Points within the space represent individual colleges and a position is determined for a particular college in relation to the other points in the space and, where the axes can be interpreted as conceptual dimensions, by the placement of the point in relation to the axes. The

more dissimilar two colleges are, the farther apart they will be located in this graphic representation.

Two levels of position analysis can be performed. A macro-analysis of position represents the market (or a substantial segment of it), and examines all relevant points in market space and their relationship to each other--particularly to the college for which the market research is being conducted. Useful and more easily obtained information can also be examined at a micro-analysis level. A comparison of a college with another specific competitor or type of competition can provide some very refined position data for fine-tuning a recruiting strategy. The latter is the less common in the marketing literature; we will use "position" in quotes when we depart from custom to deal with such micro-analysis.

A variety of measures can be used for the analysis of a market space and the position of points within it. We employ two major types of data: behavioral and psychological. (The latter can further be divided into two principal types: perceptions and preferences.) Again, the research literature has been dominated by one type of data; again, it is generally based on the more cumbersome method of data collection. Psychological measures predominate which require respondents to rate all possible pairings of colleges in a set on a similarity-dissimilarity scale or to rate each college in a set on a number of characteristics (E.g., Leister, 1975; Leister, Menzel, & Shanaman, 1976; Sternberg & Davis, 1978).

Positioning is a marketing strategy designed to locate a "product" at a desirable place in the market in relation to other products in that market. This can be accomplished by a variety of means: the selection of specific product characteristics, distribution methods, price, promotional activities, etc. In this paper we are concerned with the determination of position

through research, not with the marketing task of establishing or maintaining a particular position for an institution. Unfortunately the paper will be shy on the policy or strategy implications of the research. This is due to two reasons: 1) limits of space lead to a focus on method in a paper directed to researchers; 2) the strategy design is still in process at Carleton and is considered more confidential than the method of inquiry.

In this paper we will concentrate on a particular type of market segment: regional markets.[4] Carleton is a college that is more national in its recruitment than most. We anticipated, upon commencing the research, that the set of institutions with which we compete for students, students' knowledge about and perceptions of Carleton, and their perceptions of the advantages and disadvantages of Carleton in comparison with the competition would vary by region. Two pragmatic reasons also recommend region as a basis for segmentation: 1) it is a readily identifiable characteristic for both the research and for subsequent targeted marketing efforts (particularly for institutional presentation [publicity] but also for institutional development); 2) it relates directly to variations in costs of recruiting. For purposes of manageability in this paper, we will concentrate on two regions: the East and the North Central States. In the combined entering classes of 1976 and 1977, Carleton drew 25 per cent of its applicants from each of these two regions.

A Note on the Data

Carleton has been conducting research with our admitted applicants for six years (Sullivan, 1976; Sullivan and Litten, 1976; Litten, 1977). Our survey instrument is part of our "candidates reply form," the form on which admitted applicants indicate to the institution whether they will enroll. The questionnaire from which the data in this report are derived was administered to all admitted applicants for the freshman classes which entered in 1976

and 1977. The data base is the combined returns from both groups. We achieved a response from 99 per cent of the students who accepted our offer of admission and 67 per cent from students who decided to enroll elsewhere.

Regional Variations in the Competition Set

We started with a classification of the competition by major types of institution. Figure 1 presents a circle graph which shows the type of schools to which admitted Carleton applicants apply and the schools attended by those who decline our offer of admission.[5] A substantially greater percentage of Eastern than North Central applicants are oriented toward the Ivy League institutions and the set which we call the New England (N.E.) Elite, particularly when it comes to matriculation. North Central students are more prone than their Eastern counterparts to apply to schools in the consortium to which Carleton belongs, to private universities (non-Ivy League) and to public institutions.

A Multidimensional Scaling Analysis of Market Structure

Marketers have been using multidimensional scaling techniques for a number of years in a variety of approaches to understanding both market segments and the position of a product or a service within a market. These techniques have been applied to market analysis problems in higher education. Leister and his colleagues (Leister, 1975; Leister, et.al., 1976) have published some of the most elaborate and exemplary analyses using such techniques. Another interesting application, using severely limited data, is provided by Sternberg and Davis (1978). All of this work is based on ratings of the similarity of a number of paired institutions on one or more dimensions.

The graphs of "market space" produced through multidimensional scaling of ratings of the similarities of pairs of colleges have been the principal means of analyzing positions occupied by institutions within a given market. It is a rather cumbersome task for the rater. Our use of multidimensional scaling has employed a much more simple data collection procedure than previous applications and has been derived from a type of measurement which has not been reported previously for such types of analysis. We have drawn on a research tradition in the sociology of science (the analysis of the citation and co-citation of scientific articles) to produce multidimensional scaling plots which show both the "visibility" (or desirability, in the case of applications for admission) and market proximity of institutions with which we compete for students.[6] The reader is referred to the literature on multidimensional scaling (Green & Wind, 1973) and citation analysis (Sullivan, White, & Barboni, 1977; Small, 1973) for details on these techniques. As in other portions of the paper, only a sample of our work with this technique will be presented. We will focus on the principal institutions with which we share applications in each region--an elaboration of the type of analysis presented in the preceding section.

Figures 2a and 2b present multidimensional scaling plottings of the schools to which Carleton applicants have applied. These schools were taken from the applicant's listing of the four top choices in his or her set of applications and underrepresent "safety" applications for people who applied to more than four schools. There is a variety of information contained in the graphs. First, the size of the circles representing a given school are proportional to the absolute number of applications submitted to the school by students who also applied to Carleton. The proximity of the centers of two schools'

circles is a function of the incidence of applications to both schools by individual applicants (i.e., the more frequently people apply to both School A and School B, the closer they will be on the plot). When we lose the majority of the applicants who are admitted to both Carleton and the school named, the code name of the competing school is underlined. Finally, there are the two dimensions on our plots. The number of dimensions is fixed by the input parameters for the program and can be varied to reduce the stress (a goodness-of-fit measure). There are no substantive meanings to the dimensions, other than those which can be inferred by the placement of specific schools of known characteristics along the axes of the plots.[7]

The results of our multidimensional scaling analysis of our applicants' application sets show somewhat different market structures in the East and the Midwest. In both instances we examined the 13 schools with which we share the most overlap in applications in the given region. In the East, this set is comprised primarily of small, selective, eastern, liberal arts colleges. Furthermore, there is a sub-set of schools, primarily Ivy League and the "Little Ivys", with which Carleton not only shares a substantial number of joint applications, but which also share a great number of applications between them (at least among students who also apply to Carleton). There are several small colleges which are quite removed from both this set and from each other--applications to them overlap with Carleton, but not as strongly with other schools in our principal eastern competition set. These appear to be distinctive schools by virtue of location or character or both. There appears to be a small segment of students in the eastern market who are midwestern-oriented; they apply to Carleton and another consortium school, with little overlap in applications to the Eastern schools (the consortium school is the most isolated on our grid of these top 13 competitors in the East).

The North Central picture is different from the Eastern market. The relatively high stress value indicates that this is a highly problematic graphic representation of proximities.[8] Although the five Ivy League schools appear in both pictures and share overlap applications from Carleton applicants, another set of schools replaces the eastern small colleges and none of them show much overlap with the Ivys. These consortium colleges are fairly spread out--they do not share overlap applications like the Ivys do between themselves. A large public university also enters the picture. The spread along the horizontal axis suggests that one dimension may be geographic location--eastern schools (with one Far West exception) in the set to the left and midwestern schools on the right. Worth noting, from a competitive standpoint, is the difference in average number of applications: 3.9 in the East; 2.8 in the North Central states.[9]

A Balance Sheet for Institutional Comparisons

One of the basic tasks of the market researcher is to find out how a product or service is perceived, used, evaluated, etc. in relation to other products or services which will serve the same functions. In this section we present a graphic multidimensional balance sheet which we have used in the analysis of our "position" as determined by prospective students' evaluations of our characteristics and those of specific categories of our competition.

We asked our admitted applicants to rate Carleton and another school on twenty three characteristics. The second school, which we will refer to as "the competition", was defined in two ways: for those students who declined our offer of admission, it was the school in which they planned to enroll in the fall; for students who were coming to Carleton, the second school was the one which they would most likely have attended had they not come to Carleton.[10]

The twenty three ratings were for characteristics such as academic quality, the admissions process, student/faculty ratio, distance from home, geographic location, quality of faculty, social atmosphere, cost, size, and urban/rural location. Each institution was rated on a three-point scale (poor, good, very good) and the rating of the competition was subtracted from the rating of Carleton for each variable. This resulted in a three point scale for the relative ratings: Carleton was rated superior to the competition, equal to the competition, or inferior to the competition.

Figures 3a - d present this balance sheet approach for two types of institutions in the East and two types in the North Central region. Figures 3a and 3c show data for the same type of institution in the two regions. The extension above the baseline (0) indicates the proportion of applicants who perceive Carleton to be superior to the competition school; the extension below the base indicates a lower rating for Carleton than for the competition. We have omitted the proportion who rated Carleton and the competing school equal. Thus, the shorter the bar, the greater the proportion who gave equal ratings. (The validity of these perceptions as assessments of either institution is certainly open to challenge; a student's decision to enroll is based on perceptions, however, not necessarily on objectively ascertained and validated facts.)

In the East, there is not much differentiation between Carleton's comparative rating with the set of universities and with the set of colleges which form its principal competition. When Carleton is compared with the Ivy League schools, it is rated relatively well on costs, coeducation, and admissions process. The balance is not in our favor for the majority of the other characteristics. For size and off-campus study programs, the proportion who rated us inferior approximately equals the proportion who rated us

superior. The pattern is similar for the N.E. Elite schools, although in general the perceived equality between these schools and Carleton is greater on more dimensions than for the Ivys. A significantly greater proportion of students who compare us to the Ivys see our cost as superior than for the N.E. Elite, and the proportion who see our library as inferior is greater in the same direction. Size does not elicit the same division of responses in the Elite group as it does for people with Ivy League referrents. For both types of institutions, academic quality is perceived to be about equal to Carleton (at least as rated on a 3-point scale), and location characteristics are decidedly in favor of the competition.

Consortium schools draw the same proportion of non-matriculants among Carleton applicants in the North Central states as the Elite schools do in the East, and in the North Central states they outdraw the N.E. Elite schools in applications by 2:1. In the North Central states, however, the two major types of competing schools in the region are perceived very differently in comparison to Carleton by students who lean toward one or the other type of college. On 11 out of the 15 characteristics, there are statistically significant differences in the comparative ratings of Carleton and the competition for the two sets of schools.

When North Central applicants compare Carleton to other schools in the consortium, Carleton fares relatively well on geographic location, distance from home, academic quality, urban/rural location, size, general education emphasis, quality of faculty, graduate/professional school acceptance rate, coeducation, and admissions process. Ratings of social atmosphere are better for the remainder of the consortium, their off-campus programs are viewed more positively, and ratings of cost definitely favor these schools.

The comparative strengths and shortcomings of the Ivy League schools vs. Carleton are perceived similarly in the two regions which we are examining.

In both regions, Carleton is viewed as superior by a relatively large proportion on cost and by a noteworthy proportion on coeducation and our admissions process. There are only two dimensions in which the regions are likely to assess the relative merits differently: distance from home and urban/rural location. It is interesting to note in the Ivy comparisons that there appears to be a cosmopolitan crowd in the North Central states for whom Carleton's exurban location and nearness-to-home is a liability.

Yield Analysis

A common practice in admissions research is the analysis of yield (or "hit-ratios," as they have even been called by admissions officers who dare to identify with military vocabulary beyond the use of acronyms like PPBS) when a student applies to two or more institutions. By segmenting our market we have discovered that there are differences in our yield both between regions and between types of institutions. Table 1 shows data pertaining to the two regions and three types of competing institutions which we have selected for examination in this paper.[11] There is much less variation between the two regions in the yield than between the three types of institutions, but the interactions are of considerable interest. We do quite poorly against the Ivy League schools on their own territory; we do considerably better closer to home. Likewise, we do slightly better against the N.E. Elite in the North Central states than in the East.

Regression Analysis of Evaluative Correlates of our Yield

Our principal purpose as a college is to attract students who can benefit from our programs; this is achieved by being attractive. We sought, therefore, to assess how our relative attractiveness on the various characteristics for which we had measures was associated with the decision to attend Carleton. We have used multiple regression to relate the comparative ratings of Carleton and the competition to a dummy variable: accepting admission to Carleton/declining admission to Carleton.[12]

Past research on matriculation prediction has generally used ratings of the institution being studied (Cf., Grose, 1975; Fidler & Bucy, 1976). Comparative ratings are much better predictors of matriculation. Comparative ratings provided a much larger squared multiple correlation coefficient ($R^2$) than ratings of Carleton alone when analysis was performed on the entire data file (this comparison of the two types of measures was not made for the separate regions). A set of six variables produced a coefficient of .17 for the simple ratings of Carleton vs. a coefficient of .42 when the comparative ratings were employed.[13] This underscores the fact that position is an important problem and challenge--we operate in a market that includes competitors and our relative perceived strengths and weaknesses are major contributors to our capacity for attracting the students whom we feel will benefit from (and enhance) our programs.

We examined the correlation coefficients and regression weights for several variables with the matriculation-decision dependent variable (acceptance or rejection of our offer of admission) for each of our two regions. Table 2 presents the zero-order correlations and the number of cases on which they were based. The similarities in the size of the correlations between the two regions exceed the dissimilarities, but there are some noteworthy differences. Relative evaluation of the financial aid offers and perceptions of racial diversity were correlated differently in the two regions at a statistically significant level (.05), with each being more highly correlated in the North Central states. North Central students were also 13% more likely than Easterners to rate the financial aid offer of both schools, implying more concern with aid. Differences in correlations which were not statistically significant, but which relate to other data of note included the higher correlations for ratings of geographic location in the East and for off-campus study programs in the North Central states.

We also assessed the relative statistical contribution which the various relative ratings made to variance in the decision to matriculate.[14] The results of these runs are presented in Table 3. We used variables which were rated by a relatively large proportion of the respondents. We have taken note of the fact that 40 - 45% of the variance in our dummy dependent variable was explained by four variables, each of which has implications for marketing, both in presentation of the institution and in institutional development. In the East these characteristics are social atmosphere, academic quality, geographic location, and size. In the North Central states, ratings of cost replace ratings of size. Academic quality evaluations contribute slightly more explanatory power in predicting matriculation in the East than in the North Central states.

Summary and Discussion

We have presented a variety of methodological approaches which institutional researchers (and others) can employ in focused research efforts which support an effective marketing program for institutions of higher education. Our focus has been on analysis of market position within selected segments of the market. Both the segment definitions and the positioning referrents can readily be changed to serve the particular market and marketing challenges faced by a given institution.

With our regional segments and our focus on position vis-a-vis selected categories of institutions, our several approaches have yielded different perspectives from which the marketing problem can be viewed and from which marketing strategies can be developed. Within the constraints of institutionally confidential information, we will briefly explore some of the marketing implications. We first illustrated how the general categories of institutions which form the competition vary between geographic regions

and how they differ at different points in the application/selection process. By simply examining the characteristics of these principal categories of the competition by region we know some basic facts which are relevant to our marketing strategies. For example, the dearth of non-elite institutions in the East suggest that our relatively high cost will not be as much of a consideration as it will be in the North Central states (where public and less selective private institutions are more of a factor).

The multidimensional scaling analysis indicates that there is a very tight market structure in the East; the North Central region is somewhat more open. There are a few schools in the East which appear to have special appeal, but the overwhelming bulk of the overlap applications go to a relatively undifferentiated set of Ivy League institutions and selective colleges in the region. This appears to be a difficult market in which to operate (especially in view of the projected demographic declines in the region, Cf., Henderson (1978)). Differentiation probably can not be achieved on the basis of academic quality; it might be achieved through an institutional or cooperative campaign to market the advantages (educational and otherwise) of greater distance from familiar surroundings and proximity to areas of population growth. The North Central states appear to present a more segmented market within the region -- an Eastern oriented group (again applying to a small set of the most selective and visible institutions in the country) and a group which is more interested in more local institutions. Since these groups within the region are probably concerned with different aspects of college selection and attending to different considerations in the process, further research and selected marketing approaches for these two regional sub-segments seem worth consideration.

The relatively easily executed balance sheet analysis indicates more specifically our relative strengths and weaknesses vis-a-vis particular types of competition. Our balance sheets tell us something about why we are relatively strong in the North Central states, as documented by our segmented yield analysis. We know that we have to do a better job of marketing our location (both through institutional presentation and through the development of programs which exploit its advantages). We are also working on further research and some tentative marketing changes dealing with the social atmosphere issue. These particular foci for attention have been identified through a combination of balance sheet analysis and regression analysis of the comparative rating correlates of matriculation. The latter type of analysis also indicates that relative cost considerations are of particular importance in the North Central states. Whether to capitalize on existing strengths or to improve upon present relative weaknesses (i.e., whether to solidify a position or to reposition), however, is a marketing decision which lies beyond the market research process.

Regionally segmented analysis of yield and perceptions of the college, particularly in a comparative context, can provide important information for the allocation of recruiting efforts, institutional presentation, and institutional development. The next step beyond our analysis to this point is to relate these yield and perception data to recruitment costs and the costs of institutional change. The demographic projections in a region are also of significance. With these data in hand, the allocation of marketing resources (which include both institutional presentation and development) can be considered effectively.

We believe that we have learned important and useful things from each of these approaches and that they supplement each other. Although the order

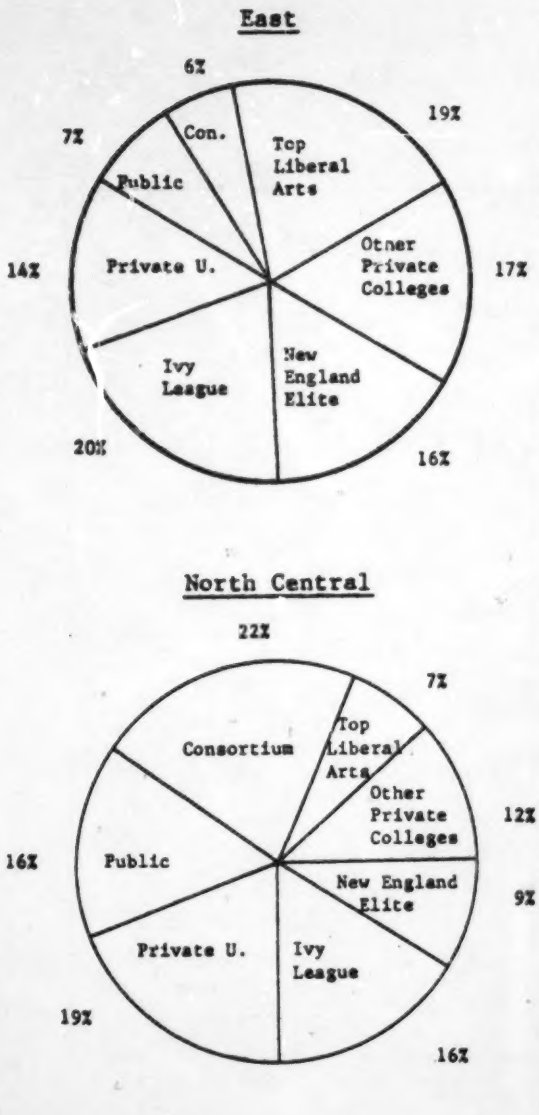
in which they were presented provided a sort of unfolding picture of our market, they were not presented in order of increasing difficulty of implementation or execution (particularly for the small college with a small computer). The approaches to be used in a particular situation should be selected in view of the marketing objectives of the institution. The research can not determine these objectives.

A final note: market research is but a small aspect of a complete marketing program. It happens to be the component in such a program with which institutional researchers are most likely to be involved. Effective market research, however, requires a broader marketing program to guide the research and to exploit the findings for better institutional presentation and the improvement of the institution. Such a program requires a team or institutional approach...and that may prove to be the most difficult part of accomplishing effective market research for colleges and universities.

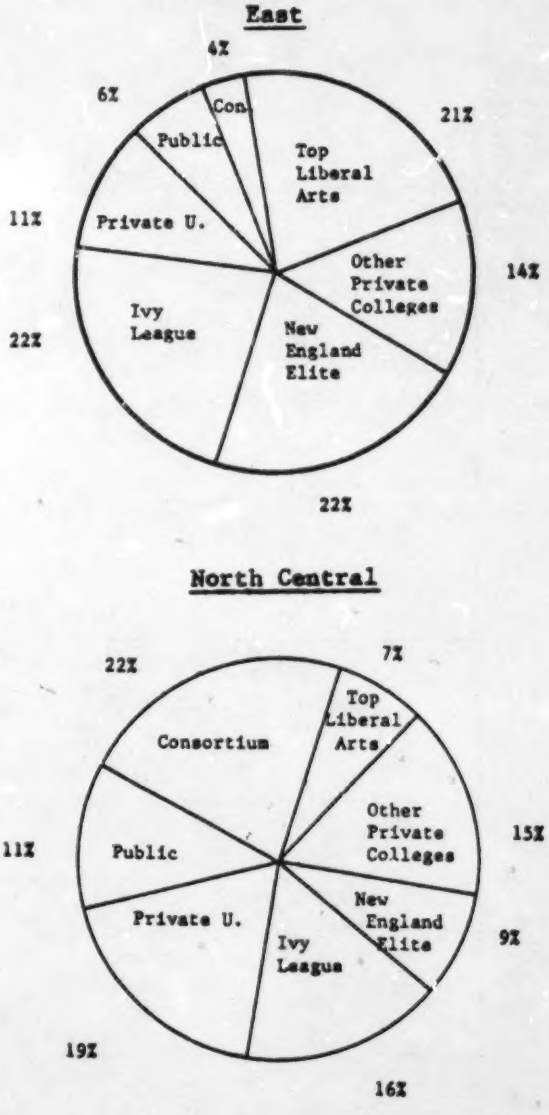
FIGURE 1

Types of Schools to Which Carleton Applicants Apply and Which Non-Matriculants Attend

A. Schools Applied To[a]




B. Schools Attended by Non-Matriculants




Key to Figure 1 (exclusive categories)

| | |
|---|---|
| Consortium (Con.) . . . . | schools in a midwestern consortium of liberal arts colleges to which Carleton belongs |
| Public . . . . . | .public colleges or universities |
| Private Universities . | .private universities (excluding Ivy League institutions) |
| Ivy Leagues . . . . | .Ivy League institutions |
| New England Elite . . | .selective liberal arts colleges in New England |
| Top Liberal Arts . . . | .liberal arts colleges located throughout the nation which are highly selective |
| Other Private Colleges . | .4-year private colleges not included in the categories listed above |

East: n = 429
North Central: n = 499

[a]Excludes applications to Carleton

N.B. All interregional differences in proportions are statistically significant (.05 level) except Ivy League applications and other Private Colleges matriculation.

FIGURE 2

Multidimensional Scaling Plottings of 13 Schools to Which Carleton Applicants from Specified Region most Frequently Submit Applications

A. East

2 dimensions; Stress = .16193

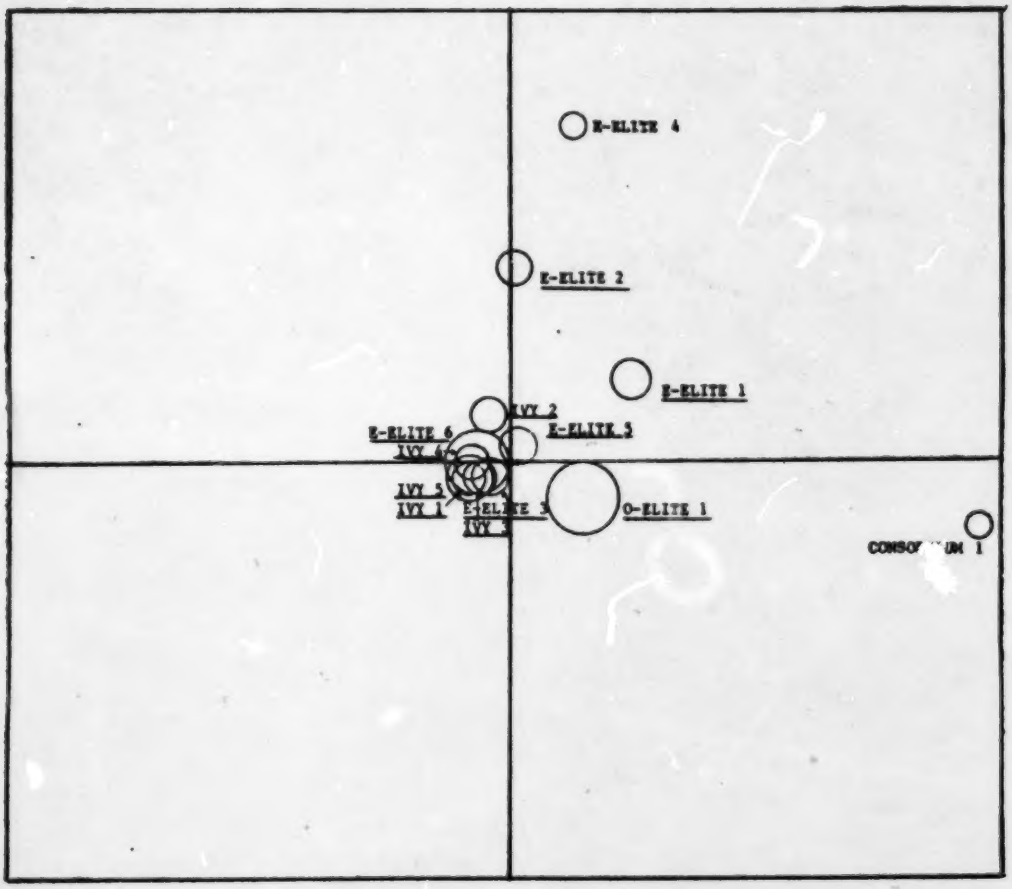
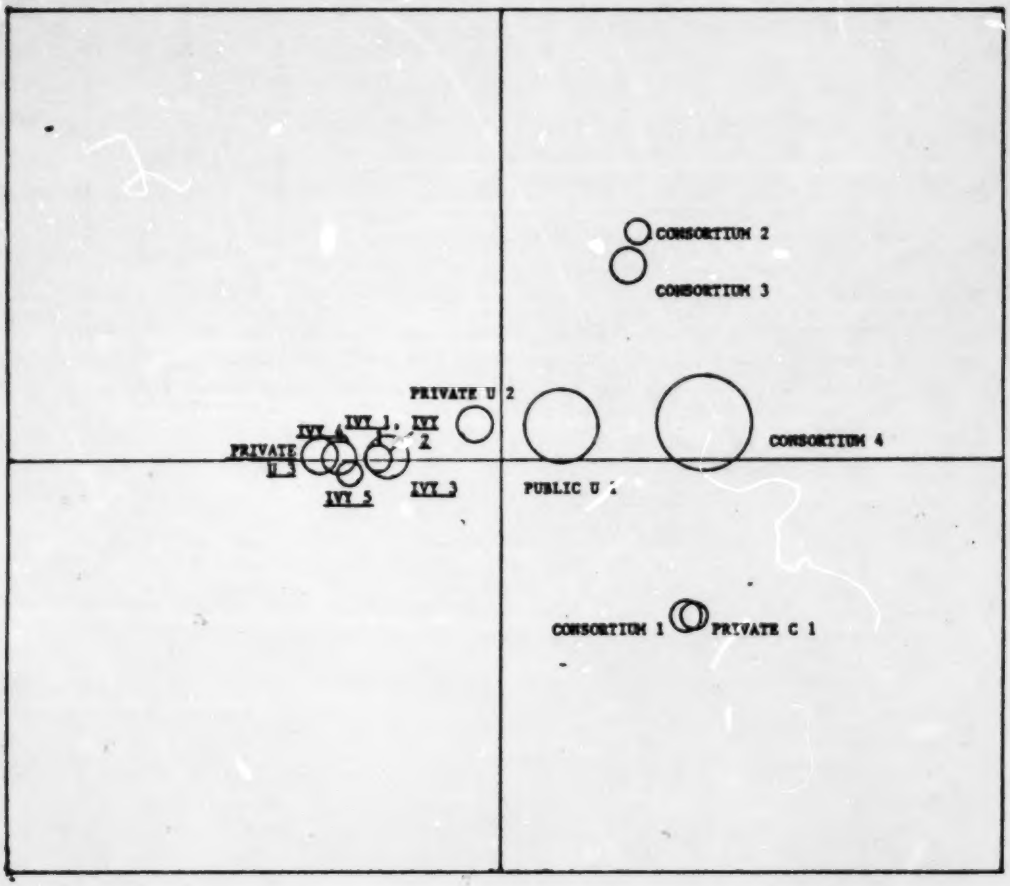


FIGURE 2 (continued)

B. North Central

2 dimensions; Stress = .46415



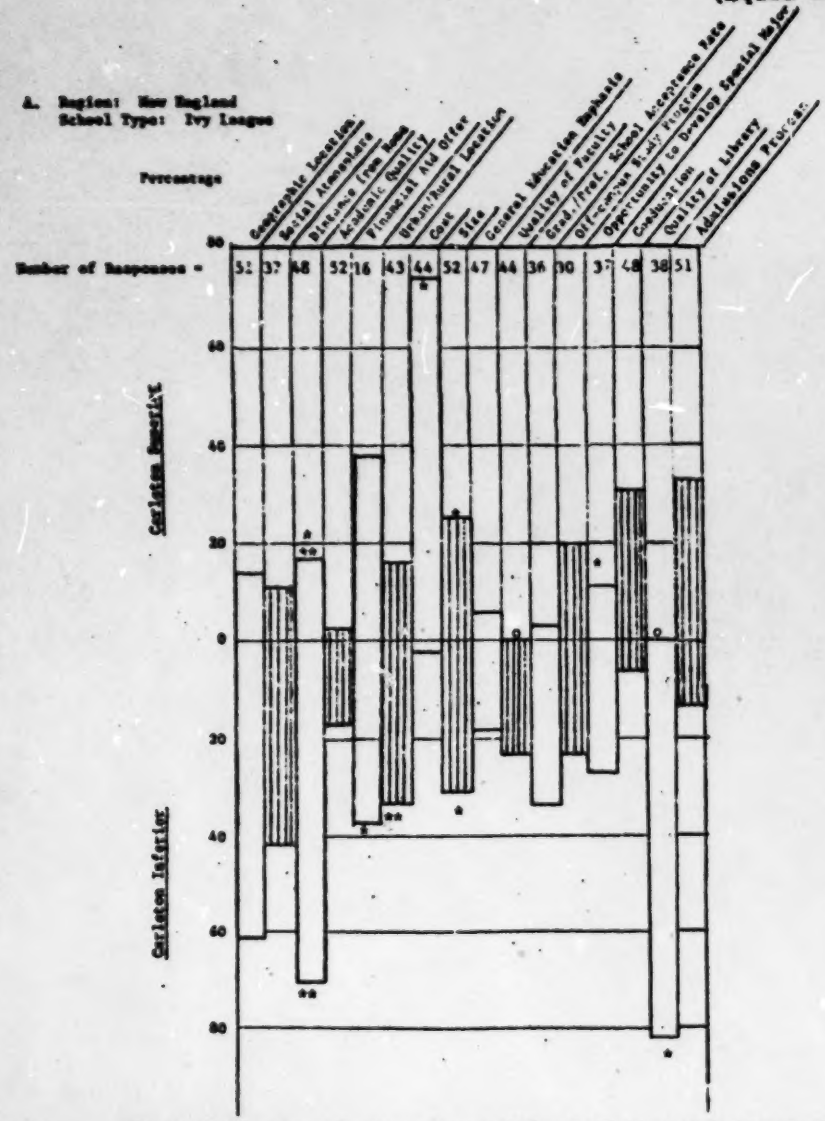

**Notes:**

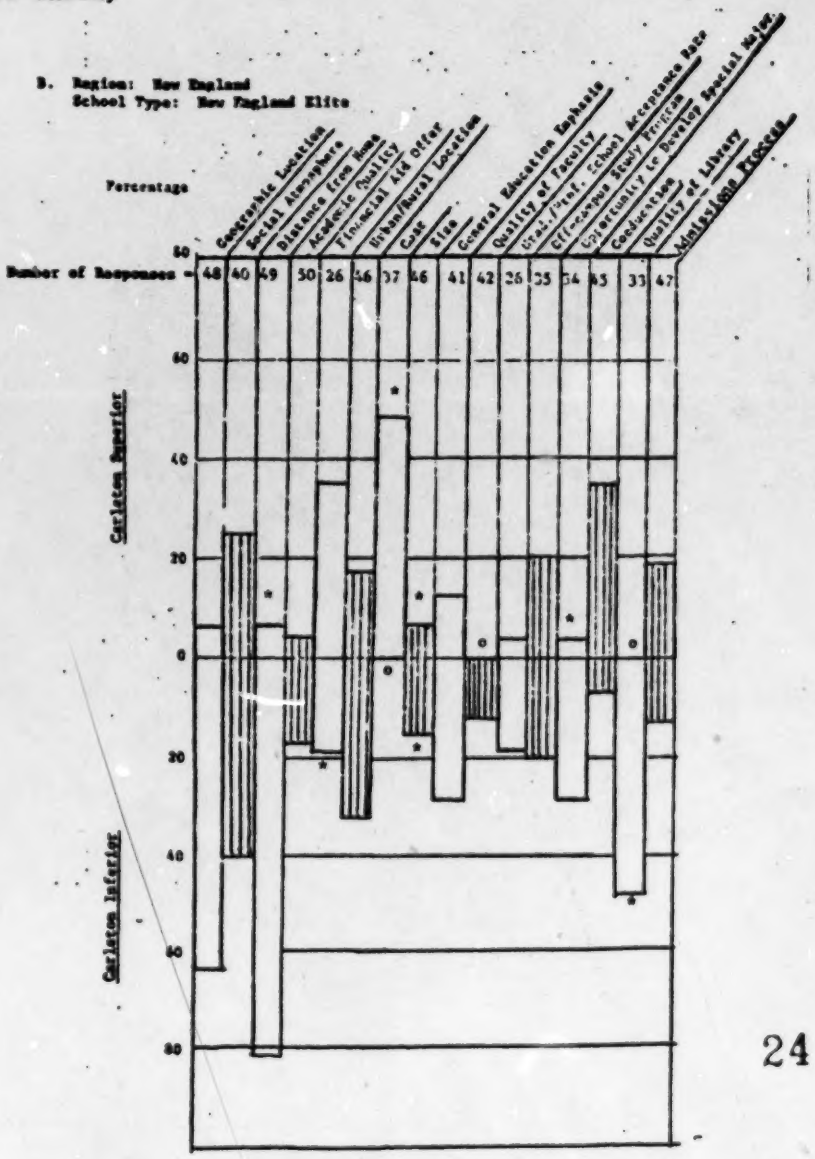
| | | |
|---|---|---|
| East: | Number of applicants | = 429 |
| | Number of applications | = 1674[a] |
| | Average number of applications | = 3.9 |
| North Central: | Number of applicants | = 499 |
| | Number of applications | = 1413[a] |
| | Average number of applications | = 2.8 |

[a]includes applications to Carleton

FIGURE 3

**Relative Ratings (Carleton minus Competition) Balance Sheet**
**(Equal Ratings Not Shown)**



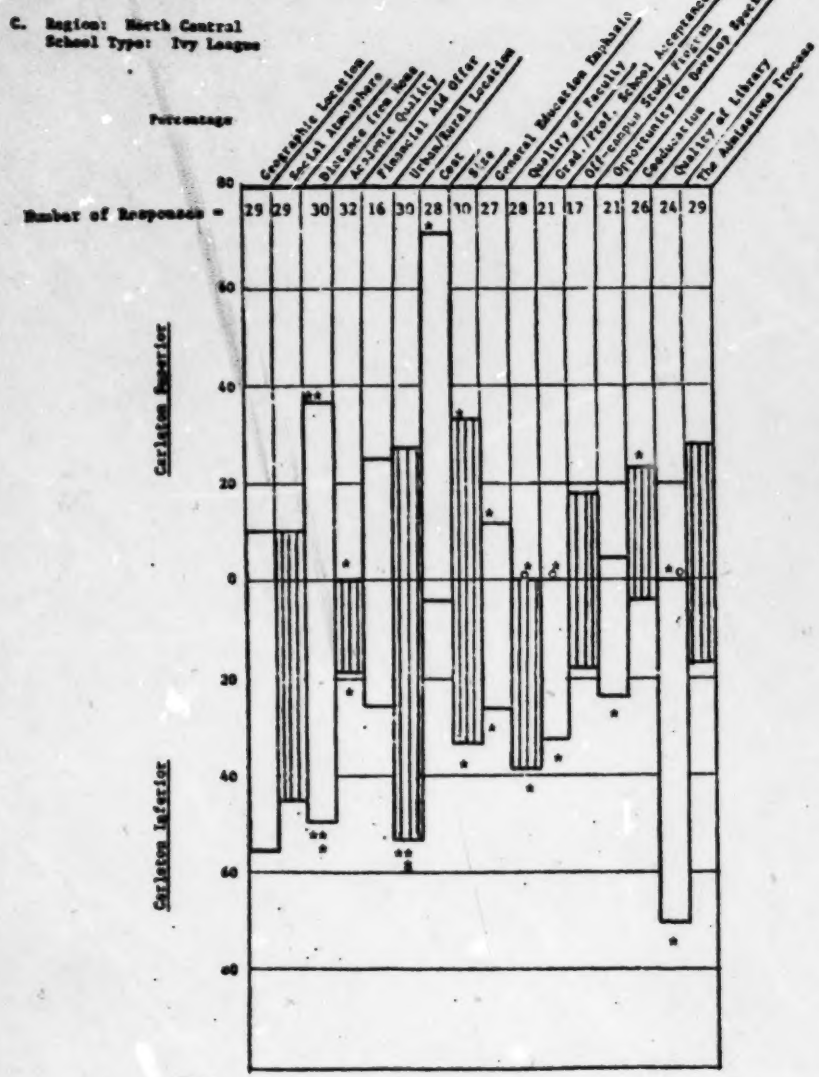




*Rating (proportion inferior or superior) for the 2 types of institutions within the same region differ significantly at .05 level (e.g., Ivy-Carleton ratings differ from Elite-Carleton ratings in New England)

**Rating (proportion superior or inferior) for specified type of school differs significantly between the two regions at the .05 level (i.e., Ivy-Carleton ratings differ between regions).

*Above the "zero-line" -- no one rated Carleton superior; below the line no one rated Carleton inferior.

FIGURE 3 (continued)

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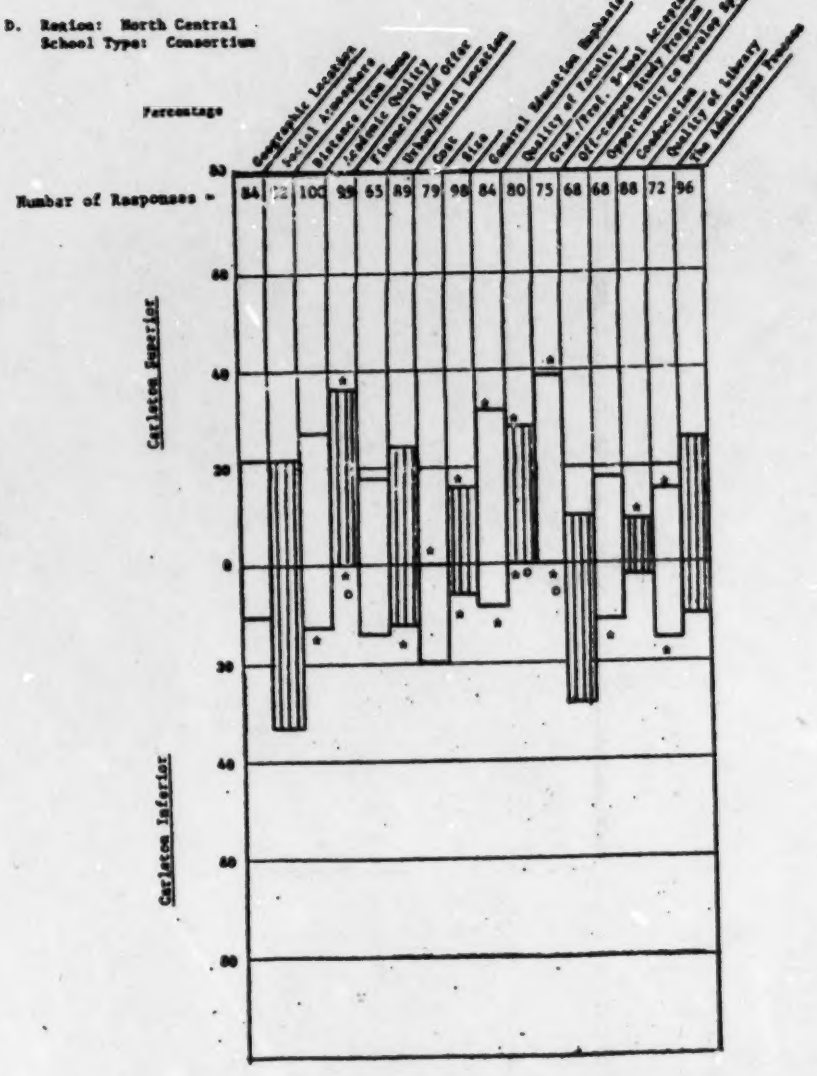


26

TABLE 1

Yield by Region and Closest Competition Type
(percentage of admitted applicants who enroll)

| | Consortium Colleges | New England Elite | Ivy League | All 9 Types of Competition |
|---|---|---|---|---|
| East | 65% (23) | 16% (56) | 9% (55) | 36% (528) |
| North Central | 65% (119) | 33% (21) | 22% (36) | 66% (597) |
| Total U.S. | 63% (256) | 19% (142) | 16% (127) | 45% (2265) |

TABLE 2

Correlation between Relative Ratings (Carleton Minus Competition) and Matriculation at Carleton

| | EAST | | | NORTH CENTRAL | | |
|---|---|---|---|---|---|---|
| Variable | Rank Order | Correlation | N | Rank Order | Correlation | N |
| Social Atmosphere | 1 | .500 | (269) | 1 | .548 | (300) |
| Graduate/Professional School Acceptance Rate | 2 | .423 | (218) | 7 | .350 | (255) |
| Academic Quality | 3 | .416 | (357) | 3 | .395 | (361) |
| Quality of Faculty | 4 | .407 | (291) | 2 | .411 | (301) |
| General Educational Emphasis | 5 | .379 | (294) | 3 | .395 | (296) |
| Urban/rural Location | 6 | .377 | (320) | 8 | .345 | (329) |
| Geographic Location | 7 | .370 | (332) | 11 | .278 | (326) |
| Size | 8 | .322 | (351) | 6 | .360 | (352) |
| Opportunity to Develop Special Major | 9 | .308 | (238) | 9 | .334 | (237) |
| Distance from Home | 10 | .281 | (338) | 14 | .241 | (355) |
| Library Quality | 11 | .220 | (341) | 19 | .166 | (365) |
| Financial Aid Offer | 12 | .206* | (137) | 5 | .387* | (220) |
| Varsity Athletics | 13 | .197 | (194) | 18 | .193 | (224) |
| Student/Faculty Ratio | 14 | .195 | (312) | 15 | .236 | (338) |
| Admissions Process | 15 | .170 | (345) | 17 | .210 | (340) |
| Off-campus study Prog. | 16 | .159 | (210) | 12 | .272 | (208) |
| Music Opportunities | 17 | .156 | (291) | 22 | .075 | (344) |
| Diversity of Residential Options | 18 | .143 | (218) | 16 | .213 | (244) |
| Computer Facilities | 19 | .138 | (104) | 10 | .314 | (140) |
| Racial/Ethnic Diversity | 20 | .108* | (193) | 13 | .260* | (224) |
| Cost | 21 | -.086 | (283) | 23 | .017 | (301) |
| Policy on Student Cars | 22 | .079 | (194) | 21 | .086 | (211) |
| Coeducation | 23 | .016 | (321) | 20 | .113 | (309) |

*Difference in correlation between regions statistically significant at .05 level

TABLE 3

Relative Ratings of Carleton and Competition[a]
Regressed on Matriculation at Carleton
(Step-wise regression; list-wise elimination of missing values)[b]

| | Cumulative, Multiple $R^2$ | Beta |
|---|---|---|
| A. East | | |
| Difference in: | | |
| Social Atmosphere | .258 | .391 |
| Academic Quality | .381 | .304 |
| Geographic Location | .426 | .200 |
| Size | .448 | .152 |
| B. North Central | | |
| Difference in: | | |
| Social Atmosphere | .317 | .449 |
| Academic Quality | .391 | .291 |
| Cost | .409 | .157 |
| Geographic Location | .427 | .136 |

[a] includes all types of competing schools

[b] all entries are statistically significant at .05 level

East: N = 241 North Central: N = 227

## FOOTNOTES

[1]This research has been supported in part by a grant from the Robert Sterling Clark Foundation.

[2]In making the formal transfer of marketing techniques from business to higher education, the essential differences in the two sectors must be considered. For a brief presentation of these difference see Litten (1978).

[3]For a more complete introduction to segmentation and positioning concepts and techniques, reference to the existing literature is advised (E.g., Kotler, 1975, Ch. 6).

[4]As noted above, the marketing and market research literature is replete with all manner of segmentation schemes. An interesting example in higher education is provided by Stevens (1977) who reported on a preliminary analysis of two segments in the market of a church-related school: members and non-members of the denomination. An early and basic approach to segmentation in higher education marketing is found in Jewett (1971).

[5]We will not further define our competition types in the interest of protecting the system of higher education from published comparisons without institutional consent.

[6]We have used a behavioral basis for proximity estimation in lieu of the complex rating systems. It is taken from the science citation analysis tradition where co-citation of two articles is taken as a measure of interrelationship between the two; the more frequently the articles are cited together, the closer their points will be located on a multidimensional scaling plot of the literature in a discipline or scientific specialty. One problem with these data derives from the fact that applications are ordered by preference (and some applications are simply to safety schools). We are working on this problem through distances weighted by a preference ranking and partitioning the school sets into schools ranked over Carleton in preference and schools ranked lower.

Our multidimensional scaling has used a co-citation dissimilarity matrix generator written by Carleton's Daniel Sullivan and Forrest Young and Jay Levinsohn's SCALAR Program (1973).

[7]Interesting examples of research which includes substantive interpretations of the dimensions are found in Cook, Krampf, and Shimp (1977) and in Sternberg and Davis (1978).

[8]Although derived from Kruskal's (1964) stress formula, the SCALAR authors caution that their measure can not be compared with the formula. They do not provide an interpretation of various levels of stress, as Kruskal does. We present the graph, however, because its picture of the sub-segments of the regional market coincides with other data on the region (cf., pg. 10). We have run the North Central data with three dimensions and reduced the stress to substantially lower levels (e.g., .17426 with 21 iterations), but the dimensions were still difficult to interpret and much more difficult to display graphically than the 2-dimensional. The major shift in the 3-dimensional plot is to isolate Consortium College 2 on one dimension and Consortium College 1 on another. One dimension generally retains the regional/extra-regional split (but it is also confused with quality and size). Another dimension seems to cluster schools by type of social atmosphere; the third is loosely a rural/urban dimension.

[9]We are in the process of analyzing similar pictures based on the schools to which applicants were actually admitted. This provides a picture of actual options, not desires, and in one region not discussed here, the picture is quite different from the application picture.

[10]These schools could be identified with reasonable accuracy for 70% of our matriculants and 64% of our non-matriculants.

[11]The classification of "Closest Competition Type" is the same as presented in Figure 1. It is calculated only for the schools identified as the competition by the principles set forth on pg. 8, i.e., it is a subset of the schools to which applications were made and to which students were admitted; only the top choice school in this subset is considered for each individual.

[12]Multiple discriminant analysis (MDA) is a better technique for performing such analysis, but we were constrained by software limitations. All of this analysis was performed using SPSS/C, a version of the Statistical Package for the Social Sciences designed for the PDP-11 series of computers which does not contain MDA, yet. (Carleton is the developer of this package and distributes it under license from SPSS, Inc.)

[13]One of the reasons for the low coefficients for the ratings of Carleton alone is the low variance. For example, 97% of the matriculants and 85% of the non-matriculants gave a top rating to Carleton's academic quality. We do know, however, that there are statistically significant differences (.05 level) between the regions in the proportions who give a particular rating for several of the specific variables.

[14]Since we were <u>comparing</u> regional results, we used a list-wise deletion of missing values in our regression runs (cases with a missing value on any variable were eliminated from the analysis) in order to enhance the reliability and comparability of the weights assigned to specific variables.

[15]Modifications of either sort must be carefully weighed against the possibility of alienating those who are presently attracted to the college and members of the institution who feel more than a pecuniary tie to the school. We assume that college personnel are rather more committed to the ideals for which their institution stands and to its traditional character than are employees of many other types of enterprise. Alienation of affection by either present participants or customary prospective participants is a serious matter for a college.

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